



(1) EC-Type Examination Certificate

(2) Directive 2006/42/EC of the European Parliament and of the Council on Machinery

(3) No. of EC-Type Examination Certificate: **ZP/C015/16**

(4) Product: **Safety acceleration sensor and safety inclination transducers of QG family**

(5) Manufacturer: **DIS Sensors bv**

(6) Address: **Oostergracht 40
3763, LZ Soest
The Netherlands**

(7) The design and construction of this machine and any acceptable variation thereto are specified in the schedule to this type examination certificate.

(8) The certification body of DEKRA EXAM GmbH, Notified Body No. 0158 according to Article 14 of Directive 2006/42/EC of the European Parliament and the Council of 17 Mai 2006, certifies that this machine has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of machinery, given in Annex 1 to the Directive. The examination and test results are recorded in the test and assessment report 20150148 Rev1

(9) The Essential Health and Safety Requirements are assured by compliance with

**EN 62061:2005 + A1:2013 + EN ISO 13849-1:2015 EN ISO 13849-2:2012
A2:2015**

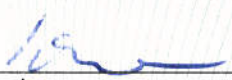
(10) This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to Directive 2006/42/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(11) The manufacturer is authorised to apply the CE Marking to the machines that conform to the types examined.



(12) This EC-Type Examination certificate is valid until 2021-08-04

DEKRA EXAM GmbH
Bochum, 2016-08-04

signed: 
Certification body


Special services unit

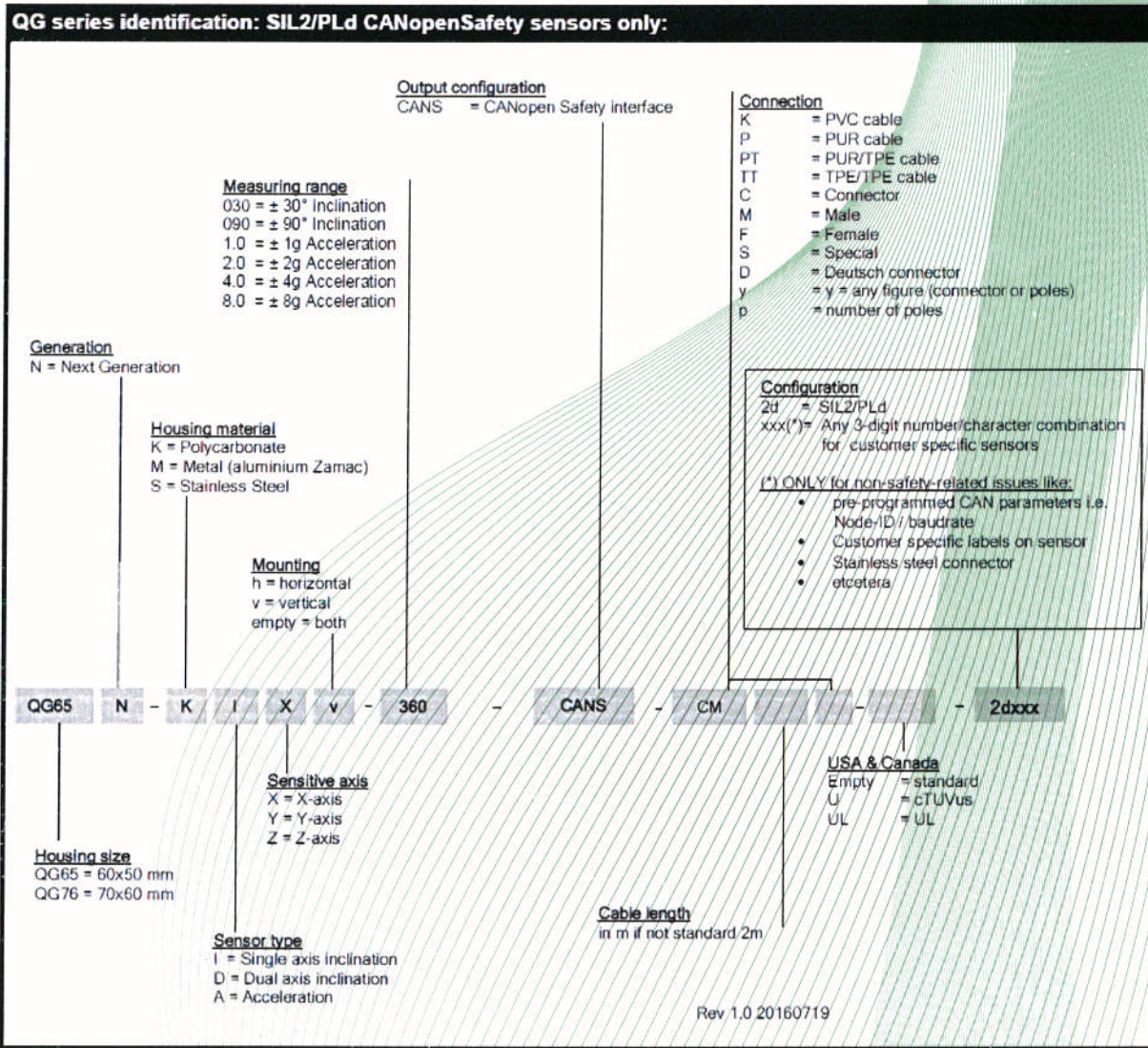


(13) Appendix to

(14) **EC-Type Examination Certificate**
ZP/C015/16

(15) 15.1 Subject and Type

All transducers of DIS QG Series with safety conformity without any changes to the hardware- and software layout, regarding the evaluated type. The following transducers are supported:



15.2 Description

The above mentioned transducers are inclination and acceleration transducers up to 3-axis. The following figure shows one possible configuration of a transducer out of the QG-Series.



15.3 Parameters

The tested type is conform to 62061:2005 + A1:2013 + A2:2015, SILCL 2. According to table 3 of ISO 13849-1:2015 the claimed SILCL 2 is corresponding to a PL d.

Tested type	
Safety Integrity Level Claim Limit	Performance Level
SILCL 2	PL d

Use case	Ambient max	λ_S	λ_D	λ_{DD}	λ_{DU}
		safe failures	dangerous failures	dangerous detected failures	dangerous undetected failures.
Standard use	45°C	287 FIT	137 FIT	128 FIT	9 FIT
High temp. use	85°C	1840 FIT	848 FIT	791 FIT	57 FIT

Use Case		Standard use	High temp. use
Ambient temperatur e	temperature of the ambience to reach the stated values	-40°C...+45°C	-40°C...+85°C
PFH _D	Probability of dangerous failure per hour	14 E-09 h ⁻¹	91 E-09 h ⁻¹
DC _{AVG}	Average Diagnostic Coverage	93%	
SFF	Probability of a safe or dangerous detected failure	98%	
System	Type A (simple) or Type B (complex)	Type B	
Proof-Test- Intervall T ₁	Time until all diagnosis, offline and online are done again to reach a "like new" state.	20 years = (175200 h)	
Diagnosis Time T ₂	Time between two test intervals of the Safety component	0,1s = (3·10 ⁻⁵ h)	
HFT	Hardware Fault Tolerance	HFT0	

(16) Test and Assessment Report

20150148 Rev1, 2016-08-03

(17) Special Conditions for Safe Use

Not applicable